CLAIMS

What is claimed is:

1. A fluorescent optical imaging system comprising:

an optical source for generating an excitation beam to be directed at a sample to be imaged in a manner generating an emission beam from the sample;

a detector for receiving the emission beam from the sample;

a parabolic mirror between the optical source and the sample for reflecting the excitation beam onto the sample and for receiving the emission beam from the sample in a manner where the excitation beam and emission beam at least partially occupy the same space; and

an optical element for geometrically separating the excitation beam from the emission beam and directing the emission beam toward the detector.

2. The fluorescent optical imaging system of claim 1 wherein the excitation beam occupies a part of the parabolic mirror and the emission beam occupies substantially all of the parabolic mirror.

3. The fluorescent optical imaging system of claim 1 wherein the optical element includes a small mirror that is smaller than an emission beam.

4. The fluorescent optical imaging system of claim 1 wherein the optical element includes a prism.

5. The fluorescent optical imaging system of claim 1 wherein the excitation beam occupies a small percentage of the space occupied by the emission beam.

6. The fluorescent optical imaging system of claim 1 wherein the optical source is adapted to generate first and second excitation beams to be directed by the objective element toward the sample in a manner generating first and second emission beams.

7. A method of fluorescent optical imaging comprising the steps of;

generating an excitation beam to be directed at a sample to be imaged in a manner generating an emission beam from the sample;

detecting the emission beam from the sample;

directing the excitation beam onto a parabolic mirror and onto the sample and gathering the emission beams with the parabolic mirror, in a manner where the excitation beam and emission beam at least partially occupy the same space; and

geometrically separating the excitation beam from the emission beam and directing the emission beam towards the detector.

8. The method of claim 7 wherein the excitation beam occupies a part of the parabolic mirror and the emission beam occupies substantially all of the parabolic mirror.

9. The method of claim 7 wherein the step of geometrically separating the excitation and emission beams includes use of a mirror with a small hole.

10. The method of claim 8 wherein the step of geometrically separating the excitation and emission beams includes use of a small mirror that is smaller than an emission beam.

11. The method of claim 7 wherein first and second excitation beams are directed by the parabolic mirror toward the sample in a manner generating first and second emission beams.